Alternative Access Techniques With Thoracic Endovascular Aortic Repair: Open Iliac Conduit vs Endoconduit Technique

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Objectives: Iliac artery endoconduits have emerged as important alternatives to retroperitoneal open iliac conduits to aid in the transfemoral delivery for thoracic endovascular aortic repair (TEVAR). We present the first comparative analysis of these alternative approaches.

Methods: All patients undergoing TEVAR (n = 577, 1993-2013) with retroperitoneal open iliac conduit (ROIC, n = 23) or internal endoconduit (EC, n = 15) were identified. The mean age of the cohort was 72.3 ± 11.6 years (81.6% female). A univariate analysis comparing the two groups is listed in the Table. The primary outcome was the composite rate of late limb loss, claudication, or repeat revascularization.

Results: Device delivery was accomplished in 100% of cases. Early mortality was seen in one patient (2.6%) undergoing endoconduit. The 2-year Kaplan-Meier survival for the entire cohort was 76.3% and did not differ between groups (ROIC: 78.3% vs endoconduit: 73.3%; $P = .583$). At a median follow-up of 10.3 months, the incidence of iliofemoral complications was 7.9%. Limb loss was seen in one patient after endoconduit. Repeat revascularization occurred in one patient after ROIC. Finally, claudication occurred in one patient after endoconduit. No variables were identified on univariate analysis as predictive of iliofemoral complications, likely due to the low event rate. Actuarial analysis showed that 12-month freedom from iliofemoral complications was 92.1% and did not differ between device delivery strategies.

Conclusions: This early comparative evaluation of alternative access routes for TEVAR suggests that an endoconduit approach is safe, effective, and associated with low rates of early mortality and late iliofemoral complications. The endoconduit may be considered an appropriate delivery route for transfemoral thoracic endovascular aortic repair.

Table. Patient characteristics with univariate analysis

Variable	*Endoconduit (n = 15)*	*Open conduit (n = 23)*	P
Age, years	72.2 ± 7.2	72.3 ± 7.3	.98
Female sex, No. (%)	12 (80.0)	19 (82.6)	1.00
Peripheral vascular occlusive disease, No. (%)	5 (33.3)	6 (27.3)	.73
Preoperative ipsilateral ankle-brachial index	0.93 ± 0.28	1.03 ± 0.09	.22
Minimum iliofemoral size, mm	4.62 ± 1.96	6.11 ± 1.25	.03
Device delivery size, F	22.46 ± 1.85	24.14 ± 1.03	.01

Lumivascular Approach to Crossing Chronic Total Occlusions Without Fluoroscopy

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Objectives: To demonstrate a case series where the use of optical coherence tomography (OCT) greatly reduced or eliminated fluoroscopy during the crossing of peripheral arterial chronic total occlusions when using the Ocelot catheter (Avinger, Redwood City, Calif).

Methods: Fifteen patients were treated for peripheral arterial chronic total occlusions (CTO) between January 2013 and June 2013. Sixteen lesions were crossed using real-time OCT as the primary imaging modality in these cases. The mean patient age was 73 years (range, 50-91 years). Ten males and 5 females were treated. Radiographic values measured included diagnostic angiography, CTO crossing fluoroscopy, and therapeutic fluoroscopy times.

Results: One hundred percent of CTOs in this series were crossed successfully via the true lumen without the use of assist or reentry devices. Mean CTO crossing fluoroscopy time was 0.24 ± 0.36 minutes (14.4 ± 21.6 seconds) using the Ocelot (Fig). In comparison, mean diagnostic and therapeutic fluoroscopic times were 5.99 ± 3.07 minutes and 14.88 ± 6.36 minutes, respectively. Mean lesion length treated was 18.6 cm (18.63 ± 8.58 cm). 16/16 lesions were reduced from 100% stenosis to less than 10% stenosis. In 15/15 cases, the mean contrast volume administered across procedures was 176.66 ± 50.08 mL (median, 180 mL; range, 100-230 mL). There were no adverse events reported at 60 days.

Conclusions: Lumivascular techniques allow for safe, quick, and efficient crossing of peripheral arterial CTOs while eliminating or significantly reducing fluoroscopic exposure and contrast administration.

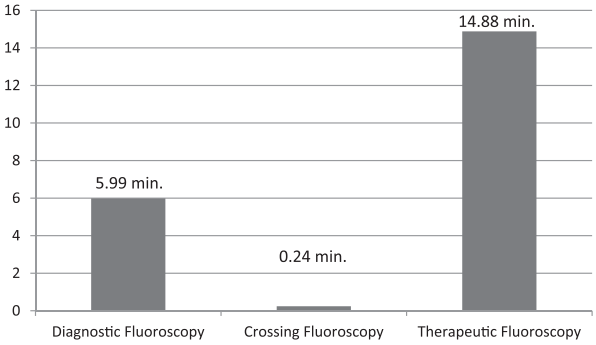

Fig. Measured fluoroscopy times. Diagnostic, crossing, and therapeutic fluoroscopy times measured across 16 lesions and illustrated in minutes.

Table. Characteristics of case series demographics, lesions, and fluoroscopy times

Age, years	*Gender*	*Treated vessel*	*SR, %*	*Diagnostic fluoro, minutes*	*Crossing fluoro, minutes*	*Intervention fluoro, minutes*	*Total fluoro, minutes*	*Occlusion length, cm*
58	M	RSFA	<10	13.9	0	14	27.9	30
85	F	RPOP	10 to 30	2.5	0	20	22.5	10
79	F	LSFA	0	6	0	6	12	15
65	F	RSFA, RPOP	<10	5	0	12.4	17.4	30
72	M	RSFA	<10	8	0.05	17	25	25
63	M	LSFA	<10	4.7	0.1	9.8	14.5	10
89	F	RSFA	<10	10	0.1	10	20	20
80	M	LSFA	<10	2	0.2	28	30	15
91	M	RPOP	<10	5.4	0.2	25.6	31	4
66	M	RSFA	<10	3.0	0.2	7.60	10.60	30
65	M	LSFA	<10	5.1	0.2	10.5	15.6	20
72	M	RSFA	<10	3.6	0.3	20	23.6	25
73	M	RSFA	<10	7.3	0.6	13	20.3	25
50	F	LT-P trunk	<10	6.3	0.9	12.3	18.6	10
80	M	LCIA	<10	7.1	1.2	17.1	24.2	10

FT, Fluoroscopy time; *LCIA*, left common liac artery; *LPER*, left peroneal artery; *LPOP*, left popliteal artery; *LTIB*, left tibial artery; *LT-P trunk*, left tibial peroneal trunk; *REIA*, right external iliac artery; *RPER*, right peroneal artery; *RPOP*, right popliteal artery; *RTIB*, right tibial artery; *SR*, stenosis reduction.